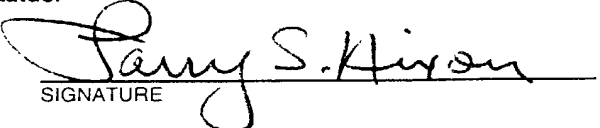


|   |   |  |
|---|---|--|
| FORM PTO-1390<br>(REV 11-2000)  | U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | ATTORNEY'S DOCKET NUMBER<br><b>34-116</b>                              |
| <b>TRANSMITTAL LETTER TO THE UNITED STATES<br/>DESIGNATED/ELECTED OFFICE (DO/EO/US)<br/>CONCERNING A FILING UNDER 35 U.S.C. 371</b>   |   | U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)<br><b>10/088647</b> |
| INTERNATIONAL APPLICATION NO.<br><b>PCT/GB00/03414</b>  | INTERNATIONAL FILING DATE<br><b>06/09/2000</b>          | PRIORITY DATE CLAIMED<br><b>20/09/1999</b>                             |
| TITLE OF INVENTION<br><b>MANUFACTURE OF DATA STORAGE DEVICES</b>  |   |  |
| APPLICANT(S) FOR DO/EO/US<br><b>GERRARD, C. et al.</b>  |   |  |
| Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:   |   |  |
| 1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.<br>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.<br>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.<br>4. <input type="checkbox"/> The U.S. has been elected by the expiration of 19 months from the priority date (Article 31).<br>5. A copy of the International Application as filed (35 U.S.C. 371(c)(2)).<br>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).<br>b. <input checked="" type="checkbox"/> has been communicated by the International Bureau.<br>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).<br>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).<br>a. <input type="checkbox"/> is attached hereto.<br>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).<br>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).<br>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).<br>b. <input type="checkbox"/> have been communicated by the International Bureau.<br>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has <b>NOT</b> expired.<br>d. <input type="checkbox"/> have not been made and will not be made.<br>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).<br>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).<br>10. <input type="checkbox"/> A English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).<br><br><b>Items 11 To 20 below concern document(s) or information included:</b><br>11. <input type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98.<br>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included.<br>13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.<br>14. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.<br>15. <input type="checkbox"/> A substitute specification.<br>16. <input type="checkbox"/> A change of power of attorney and/or address letter.<br>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.<br>18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).<br>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).<br>20. <input checked="" type="checkbox"/> Other items or information. PTO Form 1449 |   |  |

|  |              |   |           |   |            |    |        |  |    |        |  |
|--|--------------|---|-----------|---|------------|----|--------|--|----|--------|--|
| U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)<br><b>unknown 088647</b>  |              | INTERNATIONAL APPLICATION NO<br><b>PCT/GB00/03414</b> |           | ATTORNEY'S DOCKET NUMBER<br><b>34-116</b>   |            |    |        |  |    |        |  |
| 21. <input checked="" type="checkbox"/> The following fees are submitted:  |              |   |           | <b>CALCULATIONS</b> PTO USE ONLY  |            |    |        |  |    |        |  |
| <b>BASIC NATIONAL FEE (37 C.F.R. 1.492(a)(1)-(5):</b><br>-- Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO .....\$1040.00<br>-- International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....\$890.00<br>-- International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO .....\$740.00<br>-- International preliminary examination fee (37 C.F.R. 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) .....\$710.00<br>-- International preliminary examination fee (37 C.F.R. 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) .....\$100.00<br><br><div style="text-align: right;"><b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b></div> |              |   |           | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%; text-align: right;">\$</td> <td style="width:40%; text-align: right;">890.00</td> <td style="width:50%;"></td> </tr> <tr> <td style="text-align: right;">\$</td> <td style="text-align: right;">130.00</td> <td></td> </tr> </table> |            | \$ | 890.00 |  | \$ | 130.00 |  |
| \$   | 890.00       |   |           |   |            |    |        |  |    |        |  |
| \$   | 130.00       |   |           |   |            |    |        |  |    |        |  |
| Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)).  |              |   |           |   |            |    |        |  |    |        |  |
| CLAIMS   | NUMBER FILED | NUMBER EXTRA  | RATE      |   |            |    |        |  |    |        |  |
| Total Claims   | 21           | -20 = 1   | X \$18.00 | \$  | 18.00      |    |        |  |    |        |  |
| Independent Claims   | 6            | -3 = 3  | X \$84.00 | \$  | 252.00     |    |        |  |    |        |  |
| MULTIPLE DEPENDENT CLAIMS(S) (if applicable)   |              |   | \$280.00  | \$  | 0.00       |    |        |  |    |        |  |
| <b>CLAIM FEES ARE NOT BEING PAID AT THIS TIME</b>  |              |   |           | <b>TOTAL OF ABOVE CALCULATIONS =</b>  |            |    |        |  |    |        |  |
| <input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.   |              |   |           | \$  | 1290.00    |    |        |  |    |        |  |
|  |              |   |           | <b>SUBTOTAL =</b>   | \$ 1290.00 |    |        |  |    |        |  |
| Processing fee of \$130.00, for furnishing the English Translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 C.F.R. 1.492(f)).   |              |   |           | \$  | 0.00       |    |        |  |    |        |  |
|  |              |   |           | <b>TOTAL NATIONAL FEE =</b>   | \$ 1290.00 |    |        |  |    |        |  |
| Fee for recording the enclosed assignment (37 C.F.R. 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property   |              |   |           | \$  | 0.00       |    |        |  |    |        |  |
| Fee for Petition to Revive Unintentionally Abandoned Application (\$1280.00 - Small Entity = \$640.00)   |              |   |           | \$  | 0.00       |    |        |  |    |        |  |
| <b>TOTAL FEES ENCLOSED =</b>   |              |   |           | \$  | 1290.00    |    |        |  |    |        |  |
|  |              |   |           | Amount to be:   |            |    |        |  |    |        |  |
|  |              |   |           | refunded  | \$         |    |        |  |    |        |  |
|  |              |   |           | Charged   | \$         |    |        |  |    |        |  |
| a. <input checked="" type="checkbox"/> A check in the amount of \$1290.00 to cover the above fees is enclosed.<br>b. <input type="checkbox"/> Please charge my Deposit Account No. 14-1140 in the amount of \$_____ to cover the above fees. A duplicate copy of this form is enclosed.<br>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-1140. A duplicate copy of this form is enclosed.<br>d. <input checked="" type="checkbox"/> The entire content of the foreign application(s), referred to in this application is/are hereby incorporated by reference in this application.   |              |   |           |   |            |    |        |  |    |        |  |
| <b>NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</b>   |              |   |           |   |            |    |        |  |    |        |  |
| <b>SEND ALL CORRESPONDENCE TO:</b><br><br>NIXON & VANDERHYE P.C.<br>1100 North Glebe Road, 8 <sup>th</sup> Floor<br>Arlington, Virginia 22201-4714<br>Telephone: (703) 816-4000  |              |   |           |   |            |    |        |  |    |        |  |
|  |              |   |           | <br>SIGNATURE   |            |    |        |  |    |        |  |
|  |              |   |           | <b>Larry S. Nixon</b><br>NAME   |            |    |        |  |    |        |  |
|  |              |   |           | <b>25,640</b><br>REGISTRATION NUMBER  |            |    |        |  |    |        |  |
|  |              |   |           | <b>March 20, 2002</b><br>Date   |            |    |        |  |    |        |  |

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of

GERRARD, C. et al.

Atty. Ref.: 34-116

Serial No. unknown

Group:

Filed: March 20, 2002

Examiner:

For: MANUFACTURE OF DATA STORAGE DEVICES

\* \* \* \* \*

March 20, 2002

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

**PRELIMINARY AMENDMENT**

In order to place the above-identified application in better condition for examination, please amend the application as follows:

**IN THE SPECIFICATION**

Please substitute the following paragraphs in the specification for corresponding paragraphs previously presented. A copy of the amended specification paragraphs showing current revisions is attached.

Page 1, before the first line, please insert as a separate paragraph:

This application is the US national phase of international application PCT/GB00/03414 filed 6 September 2000, which designated the US.

**IN THE CLAIMS**

Please substitute the following amended claims for corresponding claims previously presented. A copy of the amended claims showing current revisions is attached.

4. A device according to claim 1 comprising an indirect drive arrangement for driving the rotary carrier, the drive arrangement comprising a motor mounted independently of the rotary carrier, and a coupling for transmitting the drive to the rotary carrier whilst minimising the transmission of any undesirable vibration.

5. A device according to Claim 4 in which the coupling comprises a resilient coupling disposed in substantially axial alignment with the rotary carrier.

6. A device according to Claim 4 in which the coupling comprises a drive belt.

7. A device according to claim 1 comprising an indirect drive arrangement for driving the rotary carrier, the drive arrangement comprising a motor mounted independently of the rotary carrier, and a drive belt for transmitting the drive to the rotary carrier.

8. A device according to Claim 2 in which at least one of the air bearings comprises a rotary spindle, and an associated indirect drive arrangement is provided for

driving the spindle, the drive arrangement comprising a motor mounted independently of the respective spindle and coupling for transmitting the drive to the respective spindle whilst minimising the transmission of any undesirable vibration.

9. A device according to Claim 2 in which at least one of the air bearings comprises a rotary spindle, and associated indirect drive arrangement is provided for driving the spindle, the indirect drive arrangement comprising a motor mounted independently of the respective spindle and a drive belt for transmitting the drive to the rotary spindle.

10. A device according to claim 1 which is arranged for writing to and verifying at least one of a hard magnetic disc, and a CD Rom.

14. A device according to Claim 12 in which the coupling means comprises a resilient coupling means disposed in substantially axial alignment with the rotary carrier.

15. A device according to Claim 12 in which the coupling means comprises a drive belt.

16. A device according to Claim 12 in which at least one of the rotary carrier, the certified head and the write head is carried on an air bearing.

18. A device according to Claim 13 in which the coupling means comprises a resilient coupling means disposed in substantially axial alignment with the rotary carrier.

19. (New) A device according to any one of Claims 13 in which at least one of the rotary carrier, the certified head and the write head is carried on an air bearing.

21. (New) A device for preparation of a media storage disc comprising:  
a single monolithic support platform, a rotary carrier supported on said  
platform and arranged for rotation of a media disc on an air bearing system, the carrier

a write head arranged for substantially radial movement relative to said carrier and for servowriting of data to said media disc, the write head being carried on an air bearing system.

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Serial No. **unknown**

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**REMARKS**

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

By:



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION**

Page 1, before the first line, please insert as a separate paragraph:

This application is the US national phase of international application PCT/GB00/03414 filed 6 September 2000, which designated the US.

**IN THE CLAIMS**

4. A device according to ~~any preceding claim~~ 1 comprising an indirect drive ~~means~~arrangement for driving the rotary carrier, the drive ~~means~~arrangement comprising a motor mounted independently of the rotary carrier, and a coupling ~~means~~ for transmitting the drive to the rotary carrier whilst minimising the transmission of any undesirable vibration.

5. A device according to Claim 4 in which the coupling ~~means~~ comprises a resilient coupling ~~means~~ disposed in substantially axial alignment with the rotary carrier.

6. A device according to Claim 4 in which the coupling ~~means~~ comprises a drive belt.

7. A device according to ~~any one of claims 1 to 3~~ comprising an indirect drive ~~means~~arrangement for driving the rotary carrier, the drive ~~means~~arrangement comprising

a motor mounted independently of the rotary carrier, and a drive belt for transmitting the drive to the rotary carrier.

8. A device according to Claim 2 ~~or Claim 3~~ in which at least one of the air bearings comprises a rotary spindle, and an associated indirect drive means~~arrangement~~ is provided for driving the spindle, the drive ~~means~~arrangement comprising a motor mounted independently of the respective spindle and coupling ~~means~~ for transmitting the drive to the respective spindle whilst minimising the transmission of any undesirable vibration.

9. A device according to Claim 2 ~~or Claim 3~~ in which at least one of the air bearings comprises a rotary spindle, and associated indirect drive ~~means~~arrangement is provided for driving the spindle, the indirect drive ~~means~~arrangement comprising a motor mounted independently of the respective spindle and a drive belt for transmitting the drive to the rotary spindle.

10. A device according to ~~any preceding~~ claim 1 which is arranged for writing to and verifying at least one of a hard ~~or floppy~~ magnetic disc, and~~or~~ a CD Rom.

14. A device according to Claim 12 ~~or Claim 13~~ in which the coupling means comprises a resilient coupling means disposed in substantially axial alignment with the rotary carrier.

15. A device according to Claim 12 ~~or 13~~ in which the coupling means comprises a drive belt.

16. A device according to ~~any one of~~ Claims 12 ~~to 15~~ in which at least one of the rotary carrier, the certified head and the write head is carried on an air bearing.

17. A device according to Claim 13 in which the coupling means comprises a resilient coupling means disposed in substantially axial alignment with the rotary carrier ~~for preparation of a media storage disc comprising:~~

~~a single monolithic support platform, a rotary carrier supported on said platform and arranged for rotation of a media disc on an air bearing system, the carrier being driven by a motor mounted independently of the rotary carrier and arranged to drive the carrier via resilient coupling means; and~~

~~a write head arranged for substantially radial movement relative to said carrier and for servowriting of data to said media disc, the write head being carried on an air bearing system.~~

18. A device according to Claim 13 in which the coupling means comprises a resilient coupling means disposed in substantially axial alignment with the rotary carrier ~~for preparation of a media storage disc comprising:~~

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Serial No. **unknown**

~~a single monolithic support platform, a rotary carrier supported on said platform and arranged for rotation of a media disc on an air bearing system, the carrier being driven by a motor mounted independently of the rotary carrier and arranged to drive the carrier via a drive belt; and~~

~~a write head arranged for substantially radial movement relative to said carrier and for servowriting of data to said media disc, the write head being carried on an air bearing system.~~

Please add new claims 19-21:

✓ 19. (New) A device according to any one of Claims 13 in which at least one of the rotary carrier, the certified head and the write head is carried on an air bearing.

20. (New) A device for preparation of a media storage disc comprising:  
a single monolithic support platform, a rotary carrier supported on said platform and arranged for rotation of a media disc on an air bearing system, the carrier being driven by a motor mounted independently of the rotary carrier and arranged to drive the carrier via a resilient coupling; and

a write head arranged for substantially radial movement relative to said carrier and for servowriting of data to said media disc, the write head being carried on an air bearing system.

21. (New) A device for preparation of a media storage disc comprising:

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Serial No. **unknown**

a single monolithic support platform, a rotary carrier supported on said platform and arranged for rotation of a media disc on an air bearing system, the carrier being driven by a motor mounted independently of the rotary carrier and arranged to drive the carrier via a drive belt; and

a write head arranged for substantially radial movement relative to said carrier and for servowriting of data to said media disc, the write head being carried on an air bearing system.

Manufacture of data storage devices

This invention relates to the manufacture of data storage devices such as magnetically and optically written discs. Examples are hard and floppy  
5 magnetic discs as used in personal computers where the data is written in magnetically as well as CD ROMs which normally have data written in optically, i.e. usually by laser beam.

The invention relates specifically to the stage of manufacture of the storage  
10 device where indexed tracks or sectors are created. These are necessary so that the data recording and reproducing systems can identify the location of data put into and read out from the storage device. Moreover for high quality performance these indexed tracks or sectors have to be very accurately provided on the storage device.

15

This manufacture involves separate stages wherein the media is examined (certified) and written to (servo written). Current practice requires separate discrete pieces of equipment to perform these tasks at separate stages of  
manufacture.

20

The tasks all require the rotation of the media disc with extreme quality of

motion while magnetic or other heads and sensors are moved across the surface with controlled motion, positional relationships and geometry. In this regard there are normally two separate units, one of which, generally referred to as a servo-writer writes the sectors to the disc, and the other, generally referred to  
5 as a verifier, verifies the surface(s) of the disc, usually optically.

The aim of this invention is to provide a particularly accurate and simple arrangement for performing these tasks, and accordingly the invention provides a single platform with the ability to carry all the systems required to perform  
10 these tasks, particularly to both verify the surface and write the sectors, at one stage within the manufacturing process.

Accordingly one aspect of the invention comprises a single monolithic support platform, a rotary carrier arranged for rotation of a media disc supported on  
15 said platform, a write head arranged for substantially radial movement relative to said carrier and for servo writing of data to said media disc and a certifier head arranged for substantially radial movement relative to said carrier and for verification of the media disc.

20 For the ultimate in quality of motion some or preferable all such motion systems should be carried on air bearings. In a preferred construction the

mountings for all of these air-bearing systems should be a single and solid component incorporating the maximum rigidity providing a common datum for each discrete process.

- 5 Accordingly a preferred form of the present invention utilises a single body to carry all the air bearing systems required to perform all the processes needed for the media to be installed in a disc drive or other data storage device. All motion systems thus contained can then be capable of simultaneous operation.
- 10 Respective drive means are typically provided for driving each of the moving components, namely, the rotary carrier, the write head and certifier head. One or more of the drive means may comprise an integrated motor which is arranged for directly driving a rotary spindle, or other member, supporting the respective component. Providing integrated drive means eases manufacture and
- 15 alignment of the constituent parts of the device.

- One or more of the drive means may be an indirect drive means comprising a motor which is mounted independently of the respective component, and coupling means for transferring the drive to the respective component whilst
- 20 minimising the transmission of any undesirable vibration. In some embodiments, the coupling means may be a resilient coupling means disposed



in substantially axial alignment with a rotary spindle of the respective component. In other embodiments, the coupling means may comprise a drive belt.

- 5 It is particularly preferred that indirect drive means are provided for driving the rotary carrier carrying the media disc. The use of indirect drive means can allow substantial mechanical isolation of the motor from sensitive parts of the device. In particular, the indirect drive can help to prevent harmful vibrations being transmitted to the media disc or the servowriter head, which might
- 10 otherwise cause track errors.

According to another aspect of the invention there is provided a method as defined in Claim 11.

- 15 According to yet another aspect of the invention there is provided a method as defined in Claim 12.

According to a further aspect of the invention there is provided a method as defined in Claim 13.

Embodiments of invention will now be described, by way of example only,  
with reference to the accompanying drawings in which:

Figure 1 shows a perspective view of a combination magnetic disc servowriter  
5 and certifier platform;

Figure 2 is a schematic side view of part of the platform shown in Figure 1,  
the platform being partly shown in section; and

10 Figure 3 is a schematic side view of part of an alternative platform, the  
alternative platform being partly shown in section.

Referring particularly to Figure 1, in a first embodiment, a common monolithic  
platform 1 is provided in the form of a single piece of material integrally  
15 forming a base support for three separate air bearing motion systems thereby  
guaranteeing the positional relationship of each to the media being processed.

This media in the form of a magnetic disc 2 is mounted on a motorised  
spindle 5 with integral position feedback and disc clamping.

20 A servowriting headstack 3 is mounted on a rotary spindle carried by an air  
bearing and is geometrically positioned in relation to the media spindle 5 so

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rotary spindle 51. Thus a direct drive is provided to the rotary carrier of the magnetic disc 2. It can be noted that all of the rotary carrier, the servowriting headstack and certified headstack are mounted on the support platform 1.

5      Figure 3 is a schematic side view of part an alternative embodiment. The alternative embodiment is similar to that described above except that the rotary carrier of the magnetic disc is indirectly driven. Again, in Figure 3, part of the platform 1 is shown in section to more clearly show the motorised spindle 5, whilst the magnetic disc 2 and selected other parts of the alternative device are  
10      omitted for the sake of simplicity.

In the alternative embodiment, the motorised spindle 5 similarly comprises a rotary spindle or shaft 51 mounted in an air bearing 52 for rotation and axially supported by an axial bearing 53. However rotational drive of the rotary spindle 51 is provided by an independent motor 6. The independent motor 6 is mounted on the support platform 1 but independently of the rotary spindle 51. Drive is transferred to the rotary spindle by way of a pair of pulleys 61 and a drive belt 62. Thus an indirect drive is provided to the rotary carrier of the magnetic disc 2 which can help to avoid undesirable vibrations being transmitted to the media disc or servo writing headstack.

In alternatives, a different form of drive coupling may be provided between an independent motor and the rotary carrier of the magnetic disc. This may take the form of a resilient solid or a fluid based coupling. Typically such a coupling will be disposed in alignment with both the axis of the rotary carrier and the axis of the motor.

In other alternatives, the independent motor in an indirect drive device can be mounted externally, and/or entirely independently of the monolithic platform block.

10

In further alternatives, one or more of the motion systems may not be of an air bearing design but some form of mechanical device.

In operation of any of the embodiments described above, a newly machined and finished disc or stack of discs will be loaded onto the media spindle disc clamp, after which the spindle will spin up to the operating speed. The servowriting and certifying tasks are completely independent and may be carried out in any order or simultaneously. However, the certifying process, which is typically an optical examination of the disc surfaces, can be conducted much more quickly (in the order of 20 seconds) than the servowriting (say 20 minutes). Thus it is sensible to either certify first or simultaneously with the

- start of the servowriting process. Preferably the servowriting and certifier headstacks will start their motion simultaneously allowing the integrity of the medium to be confirmed and the servo pattern to be written onto the disc. If the certifier identifies a faulty disc the process will be stopped and the disc
- 5   discarded. After the process is complete the media will be ready for assembly into a disc drive or other data storage device. Using a device of the type described herein, it is possible to achieve track densities in the order of 40,000 tracks per inch.
- 10   Although not described in detail, systems similar to those described and within the scope of the present invention can be used for processing other types of media discs.

## CLAIMS:

1. A device for preparation of a media storage disc comprising a single monolithic support platform, a rotary carrier arranged for rotation of a media disc supported on said platform, a write head arranged for substantially radial movement relative to said carrier and for servo writing of data to said media disc and a certifier head arranged for substantially radial movement relative to said carrier and for verification of the media disc.
2. A device according to Claim 1 in which the rotary carrier, the write head and the certifier head are all carried on air bearing systems.
3. A device according to Claim 2 in which mountings for each of said air bearing systems are formed within said single monolithic support platform, thereby ensuring a common datum for both writing to and verifying the disc.
4. A device according to any preceding claim comprising indirect drive means for driving the rotary carrier, the drive means comprising a motor mounted independently of the rotary carrier, and coupling means for transmitting the drive to the rotary carrier whilst minimising the transmission of any undesirable vibration.

5. A device according to Claim 4 in which the coupling means comprises a resilient coupling means disposed in substantially axial alignment with the rotary carrier.

5      6.      A device according to Claim 4 in which the coupling means comprises  
a drive belt.

7. A device according to any one of claims 1 to 3 comprising indirect drive means for driving the rotary carrier, the drive means comprising a motor mounted independently of the rotary carrier, and a drive belt for transmitting the drive to the rotary carrier.

8. A device according to Claim 2 or Claim 3 in which at least one of the air bearings comprises a rotary spindle, and associated indirect drive means is provided for driving the spindle, the drive means comprising a motor mounted independently of the respective spindle and coupling means for transmitting the drive to the respective spindle whilst minimising the transmission of any undesirable vibration.

20      9.      A device according to Claim 2 or Claim 3 in which at least one of the  
air bearings comprises a rotary spindle, and associated indirect drive means is



provided for driving the spindle, the drive means comprising a motor mounted independently of the respective spindle and a drive belt for transmitting the drive to the rotary spindle.

- 5 10. A device according to any preceding claim which is arranged for writing to and verifying a hard or floppy magnetic disc or a CD Rom.
11. A method of preparing media storage discs comprising the steps of mounting a media disc on a rotary carrier supported on a platform,
- 10 servowriting data to the mounted media disc with a write head and verifying the mounted media disc using a certifier head without removing the media disc from the rotary carrier between the servowriting and verifying steps.
12. A device for preparation of a media storage disc comprising a single
- 15 monolithic support platform, a rotary carrier arranged for rotation of a media disc supported on said platform, a write head arranged for substantially radial movement relative to said carrier and for servo writing of data to said media disc and indirect drive means for driving the rotary carrier, the drive means comprising a motor mounted independently of the rotary carrier, and coupling
- 20 means for transmitting the drive to the rotary carrier whilst minimising the transmission of any undesirable vibration.

13

13. A device for preparation of a media storage disc comprising a single monolithic support platform, a rotary carrier arranged for rotation of a media disc supported on said platform, a certifier head arranged for substantially radial movement relative to said carrier and for verification of the media disc and indirect drive means for driving the rotary carrier, the drive means comprising a motor mounted independently of the rotary carrier, and coupling means for transmitting the drive to the rotary carrier whilst minimising the transmission of any undesirable vibration.

10      14.      A device according to Claim 12 or Claim 13 in which the coupling  
means comprises a resilient coupling means disposed in substantially axial  
alignment with the rotary carrier.

15. A device according to Claim 12 or 13 in which the coupling means  
15 comprises a drive belt.

16. A device according to any one of Claims 12 to 15 in which at least one of the rotary carrier, the certified head and the write head is carried on an air bearing.

20

17. A device for preparation of a media storage disc comprising:

14

a single monolithic support platform, a rotary carrier supported on said platform and arranged for rotation of a media disc on an air bearing system, the carrier being driven by a motor mounted independently of the rotary carrier and arranged to drive the carrier via resilient coupling means; and

5 a write head arranged for substantially radial movement relative to said carrier and for servowriting of data to said media disc, the write head being carried on an air bearing system.

18. A device for preparation of a media storage disc comprising:

10 a single monolithic support platform, a rotary carrier supported on said platform and arranged for rotation of a media disc on an air bearing system, the carrier being driven by a motor mounted independently of the rotary carrier and arranged to drive the carrier via a drive belt; and

a write head arranged for substantially radial movement relative to said  
15 carrier and for servowriting of data to said media disc, the write head being carried on an air bearing system.

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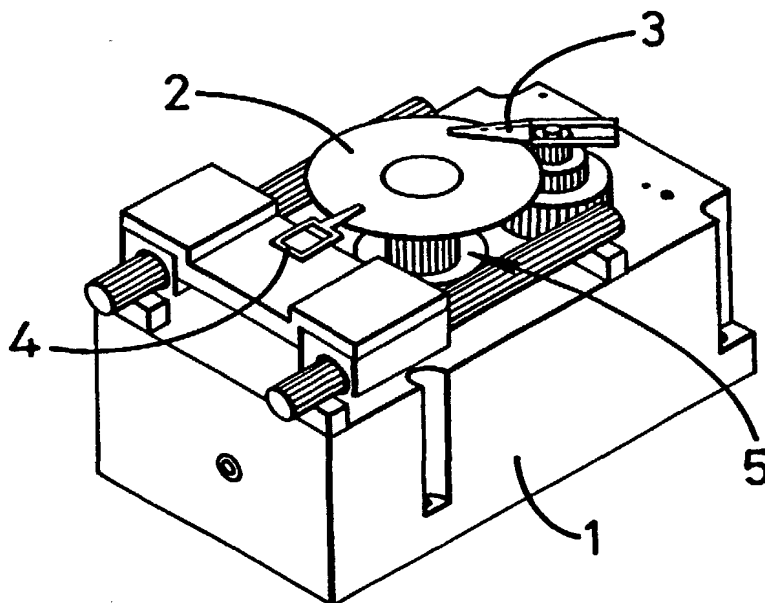
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(54) Title: **MANUFACTURE OF DATA STORAGE DEVICES**

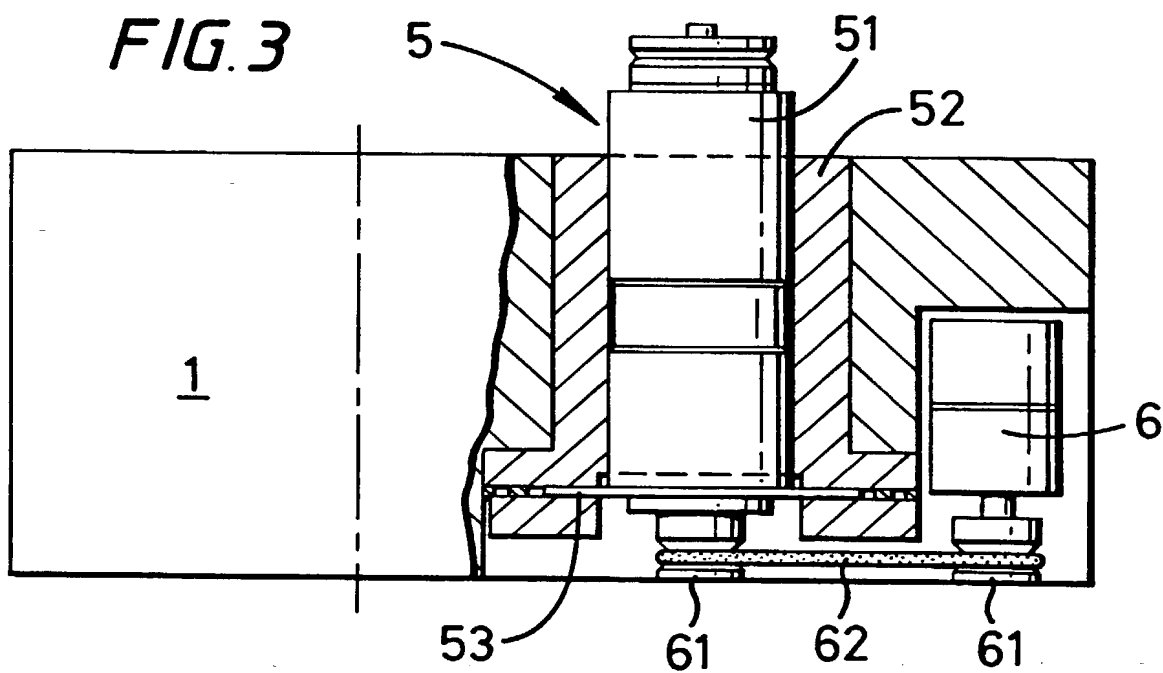
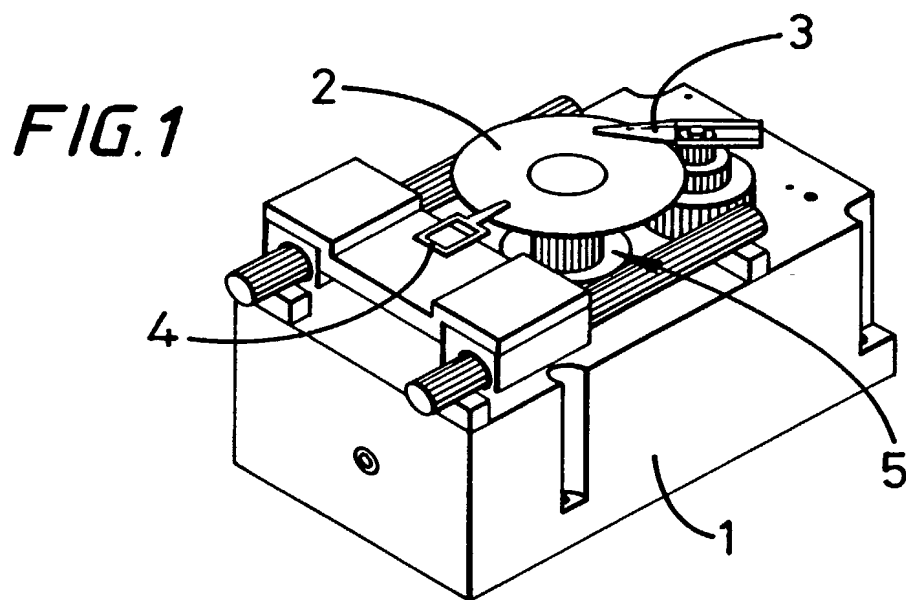


(57) Abstract: A device and method for preparing media discs (2) in which servowriting and verification of the media may be carried out simultaneously. A common monolithic platform (1) is provided which supports air bearing systems which allow movement of a media disc rotary carrier (5), a servowriting headstack (3) and certifier headstack (4). Indirect drive may be provided to the rotary carrier (5) via coupling means (62).



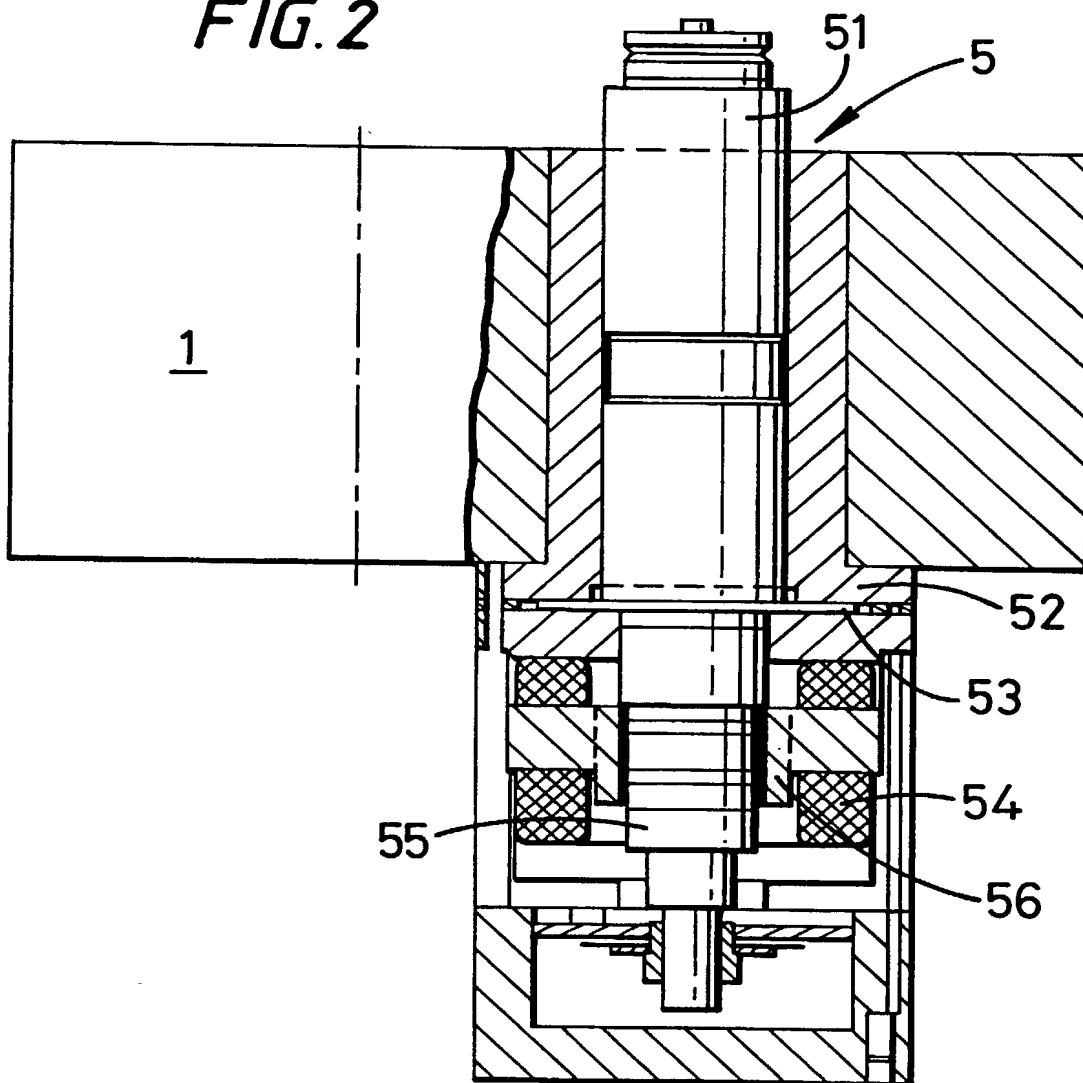
**WO 01/22410 A1**

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FIG. 2





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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

268050



Nixon & Vanderhye P.C. (10/99)  
(Domestic Non-Assigned/Foreign)

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: Manufacture of Data Storage Devices

the specification of which (check applicable box(s)):

- ☒ is attached hereto  
☐ was filed on \_\_\_\_\_

as U.S. Application Serial No. \_\_\_\_\_

(Atty Dkt. No. \_\_\_\_\_)

☒ was filed as PCT International application No. PCT/GB00/03414 on 06.09.00  
 and (if applicable to U.S. or PCT application) was amended on \_\_\_\_\_

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 C.F.R. 1.56. I hereby claim foreign priority benefits under 35 U.S.C. 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed or, if no priority is claimed, before the filing date of this application:

Priority Foreign Application(s):

| Application Number      | Country       | Day/Month/Year Filed               |
|-------------------------|---------------|------------------------------------|
| 9922238.2 and 0010272.3 | GREAT BRITAIN | 20.09.99 and 27.04.00 respectively |

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

| Application Number | Date/Month/Year Filed |
|--------------------|-----------------------|
|                    |                       |

I hereby claim the benefit under 35 U.S.C. 120/365 of all prior United States and PCT international applications listed above or below and, insofar as the subject matter of each of the claims of this application is not disclosed in such prior applications in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. 1.56 which occurred between the filing date of the prior applications and the national or PCT international filing date of this application:

Prior U.S./PCT Application(s):  
 Application Serial No. \_\_\_\_\_

Day/Month/Year Filed \_\_\_\_\_

Status: patented  
 pending, abandoned

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon. And on behalf of the owner(s) hereof, I hereby appoint NIXON & VANDERHYE P.C., 1100 North Glebe Rd., 8<sup>th</sup> Floor, Arlington, VA 22201-4714, telephone number (703) 816-4000 (to whom all communications are to be directed), and the following attorneys thereof (of the same address) individually and collectively owner's/owners' attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent: Arthur R. Crawford, 25327; Larry S. Nixon, 25640; Robert A. Vanderhye, 27076; James T. Hosmer, 30184; Robert W. Faris, 31352; Richard G. Besha, 22770; Mark E. Nusbaum, 32348; Michael J. Keenan, 32106; Bryan H. Davison, 30251; Stanley C. Spooner, 27393; Leonard C. Mitchard, 29009; Duane M. Byers, 33363; Jeffrey H. Nelson, 30481; John R. Lastova, 33149; H. Warren Burnam, Jr. 29366; Thomas E. Byrne, 32205; Mary J. Wilson, 32955; J. Scott Davidson, 33489; Alan M. Kagen, 36178; Robert A. Molan, 29834; B. J. Sadoff, 36663; James D. Berquist, 34776; Updeep S. Gill, 37334; Michael J. Shea, 34725; Donald L. Jackson, 41090; Michelle N. Lester, 32331; Frank P. Presta, 19828; Joseph S. Presta, 35329. I also authorize Nixon & Vanderhye to delete any attorney names/numbers no longer with the firm and to act and rely solely on instructions directly communicated from the person, assignee, attorney, firm, or other organization sending instructions to Nixon & Vanderhye on behalf of the owner(s).

|    |  |  |
|----|--|--|
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FOR ADDITIONAL INVENTORS, check box ☒ and attach sheet with same information and signature and date for each.

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(first) MI (last) (citizenship)  
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